WHAT IS CLAIMED IS:

1. A method for forming a read transducer, comprising:

forming, over a sensor, a first hard layer having a width for defining a width of the sensor;

forming, on a first and second side of the sensor and hard layer, a hard bias layer having a height substantially equal to a height of the sensor;

forming a lead layer over the hard layer and the hard bias layer;

forming a second hard layer over the lead layer;

forming, over the second hard layer, a top mask layer having an opening substantially equal to the width of the sensor;

removing a portion of the second hard layer and a portion of the lead layer accessible through the opening in the top mask layer;

removing the top mask layer; and

shaping a remaining portion of the second hard layer and a remaining portion of the lead layer to a desired form.

2. The method of claim 1 wherein the forming, over a sensor, a first hard layer having a width for defining a width of the sensor further comprises forming a sensor layer, forming a first hard layer over the sensor layer, forming a photoresist over the hard layer where the sensor is to be formed and removing portions of the first hard layer and the sensor layer that are not obscured by the photoresist.

3. The method of claim 1 wherein the removing portions of the first hard layer and the sensor layer that are not obscured by the photoresist further comprises ion milling portions of the first hard layer and the sensor layer that are not obscured by the photoresist.

4. The method of claim 2, wherein the forming, on a first and second side of the sensor and hard layer, a hard bias layer having a height substantially equal to a height of the sensor further comprises depositing a hard bias layer over and around the first hard layer having a width for defining the sensor, ion milling a portion of the hard bias layer until the hard bias layer comprises a first and second side portion opposite the sensor and first hard layer and a third portion over the first hard layer, depositing a bottom mask layer over the ion milled portion of the hard bias layer and the first hard layer, chemical mechanical polishing the bottom mask layer and the portion of the hard bias layer over the first hard layer until the first hard layer is encountered and wet etching the bottom mask layer and hard bias layer until the hard bias layer has a desired height.

5. The method of claim 4, wherein the depositing, over the second hard layer, a top mask layer having an opening substantially equal to the width of the sensor further comprises forming a top mask layer over the second hard layer and CMP polishing the top mask layer down to the second hard layer.

6. The method of claim 5, wherein the removing a portion of the second hard layer and a portion of the lead layer accessible through the opening in the top mask layer further comprises removing a portion of the second hard layer between the opening in the top mask layer using reactive ion etching (RIE) and removing a portion of the lead layer between remaining portions of the second hard layer by ion milling.

7. The method of claim 6, wherein the removing the top mask layer further comprise wet etching the top mask layer to remove the top mask layer.

8. The method of claim 7, wherein the shaping a remaining portion of the second hard layer and a remaining portion of the lead layer to a desired form further comprises CMP polishing the first hard layer and remaining portions of the lead layer and the second hard layer to remove portions of the remaining portions of the lead layer and the second hard layer away from the sensor to provide the remaining portions of the lead layer a surface sloping toward the first hard layer.

9. The method of claim 8, wherein the shaping a remaining portion of the second hard layer and a remaining portion of the lead layer to a desired form further comprises removing the first hard layer and the remaining portions of the second hard layer using reactive ion etching.

10. The method of claim 1, wherein the forming, on a first and second side of the sensor and hard layer, a hard bias layer having a height substantially equal to a height of the sensor further comprises depositing a hard bias layer over and around the first hard layer, ion milling a portion of the hard bias layer until the hard bias layer comprises a first and second side portion opposite the sensor and fist hard layer and a third portion over the first hard layer, depositing a bottom mask layer over the ion milled portion of the hard bias layer and the first hard layer, chemical mechanical polishing the bottom mask layer and the portion of the hard bias layer over the first hard layer until the first hard layer is encountered and wet etching the bottom mask layer and hard bias layer until the hard bias layer has a desired height.

11. The method of claim 10, wherein the depositing the bottom mask layer further comprise forming a layer of Al_2O_3.

12. The method of claim 1, wherein the forming, over the second hard layer, a top mask layer having an opening substantially equal to the width of the sensor further comprises forming a top mask layer over the second hard layer and CMP polishing the top mask layer down to the second hard layer.

13. The method of claim 1, wherein the removing a portion of the second hard layer and a portion of the lead layer accessible through the opening in the top mask layer further comprises removing a portion of the second hard layer between the opening in the top mask layer using reactive ion etching (RIE) and removing a portion of the lead layer between remaining portions of the second hard layer by ion milling.

14. The method of claim 1, wherein the removing the top mask layer further comprise wet etching the mask layer to remove the top mask layer.

15. The method of claim 1, wherein the shaping a remaining portion of the second hard layer and a remaining portion of the lead layer to a desired form further comprises CMP polishing the first hard layer and remaining portions of the lead layer and the second hard layer to remove portions of the remaining portions of the lead layer and the second hard layer away from the sensor to provide the remaining portions of the lead layer a surface sloping toward the first hard layer.

16. The method of claim 13, wherein the shaping a remaining portion of the second hard layer and a remaining portion of the lead layer to a desired form further comprises removing the first hard layer and the remaining portions of the second hard layer using reactive ion etching.

17. The method of claim 1, wherein the forming the hard bias layer further comprise forming a Chromium/hard bias layer.

18. The method of claim 1, wherein the forming the first hard layer further comprise forming a diamond-like carbon layer.

19. The method of claim 1, wherein the forming the second hard layer further comprise forming a diamond-like carbon layer.

20. The method of claim 1, wherein the forming the top mask layer further comprise forming a layer of Al_2O_3.

21. A method for forming a read transducer, comprising:

forming a sensor layer over a first gap layer;

forming, over the sensor layer, a first hard layer;

forming over the first hard layer a photoresist having a width equal to a desired width of a sensor;

removing portions of the first hard layer and the sensor layer not blocked by the photoresist to form a sensor;

removing the photoresist;

forming a hard bias layer on a first and second side of remaining portions of the first hard layer and sensor layer; and

processing a second hard layer, a lead layer and a masking layer formed over the hard bias layer and the remaining portions of the first hard layer and sensor layer using CMP polishing, ion etching and ion milling to prevent nonuniformity of layer thickness near the sensor.

22. The method of claim 21, wherein the forming a hard bias layer on a first and second side of remaining portions of the first hard layer and sensor layer further comprises depositing a hard bias layer over and around the first hard layer, ion milling a portion of the hard bias layer until the hard bias layer comprises a first and second side portion opposite the remaining portions of the first hard layer and sensor layer and a third portion over the first hard layer, depositing a bottom mask layer over the ion milled portion of the hard bias layer and the first hard layer, chemical mechanical polishing the bottom mask layer and the portion of the hard bias layer over the first hard layer until the first hard layer is encountered and wet etching the bottom mask layer and hard bias layer until the hard bias layer has a desired height.

23. The method of claim 22, wherein the depositing the bottom mask layer further comprise forming a layer of Al_2O_3.

24. The method of claim 21, wherein the processing a second hard layer, a lead layer and a masking layer formed over the hard bias layer and the remaining portions of the first hard layer and sensor layer further comprises forming, over the second hard layer, a top mask layer having an opening substantially equal to the width of the sensor by forming a top mask layer over the second hard layer and CMP polishing the top mask layer down to the second hard layer.

25. The method of claim 24, wherein the processing a second hard layer, a lead layer and a masking layer formed over the hard bias layer and the remaining portions of the first hard layer and sensor layer further comprises removing a portion of the second hard layer and a portion of the lead layer accessible through the opening in the top mask layer.

26. The method of claim 25, wherein the removing a portion of the second hard layer and a portion of the lead layer accessible through the opening in the top mask layer further comprises removing a portion of the second hard layer between the opening in the top mask layer using reactive ion etching (RIE) and removing a portion of the lead layer between remaining portions of the second hard layer by ion milling.

27. The method of claim 25, wherein the processing a second hard layer, a lead layer and a masking layer formed over the hard bias layer and the remaining portions of the first hard layer and sensor layer further comprises removing the top mask layer further comprise wet etching the mask layer to remove the top mask layer.

28. The method of claim 21, wherein the processing a second hard layer, a lead layer and a masking layer formed over the hard bias layer and the remaining portions of the first hard layer and sensor layer further comprises shaping a remaining portion of the second hard layer and a remaining portion of the lead layer to a desired form.

29. The method of claim 28, wherein the shaping a remaining portion of the second hard layer and a remaining portion of the lead layer to a desired form further comprises CMP polishing the first hard layer and remaining portions of the lead layer and the second hard layer to remove portions of the remaining portions of the lead layer and the second hard layer away from the sensor to provide the remaining portions of the lead layer a surface sloping toward the first hard layer.

30. The method of claim 29, wherein the shaping a remaining portion of the second hard layer and a remaining portion of the lead layer to a desired form further comprises removing the first hard layer and the remaining portions of the second hard layer using reactive ion etching.

31. The method of claim 21, wherein the forming the first and second hard layers further comprise forming a diamond-like carbon layer.